AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the above-identified application:

Claim 1 (currently amended): A system for analyzing a depressurization event resulting from an aperture in a vessel having a compartment having a predetermined volume, the system comprising:

a pressure sensor configured to sense pressure within the compartment and supply pressure signals representative thereof;

a temperature sensor configured to sense temperature within the compartment and supply temperature signals representative thereof; and

~~the~~ a processor coupled to receive the pressure signals and the temperature signals, the processor configured, in response thereto, to:

determine a first derivative of pressure with respect to time and a feeding volume; and

~~to~~ determine a size of the aperture based at least in part on the first derivative of pressure with respect to time, the determined feeding volume, the predetermined volume, the sensed compartment pressure, and the sensed compartment temperature.

Claim 2 (currently amended): The system of claim 1, wherein:

the ~~processor is further configured to determine a~~ determined feeding volume is based at least in part on the first derivative of pressure with respect to time, the predetermined volume, the sensed compartment pressure, and the sensed compartment temperature~~; and~~

~~the determination of the aperture size is further based on the determined feeding volume~~.

Claim 3 (original): The system of claim 2, further comprising:

memory coupled to the processor, the memory having stored therein data that relates aperture size to feeding volume and first derivatives of pressure with respect to time,

wherein the processor determines the aperture size based at least in part on the stored data.

Claim 4 (original): The system of claim 1, wherein the processor is further configured to supply information representative of the depressurization event, the system further comprising a reporter coupled to receive information signals from the processor and configured to report depressurization event information.

Claim 5 (original): The system of claim 1, wherein the processor is further configured to:

determine a second derivative of pressure with respect to time in the compartment; and

determine a rate of growth of the aperture size based at least in part on the second derivative of pressure.

Claim 6 (original): The system of claim1, wherein the processor is further configured to determine one or more times at which one or more predetermined pressures will be reached in the compartment.

Claim 7 (original): The system of claim1, wherein the compartment comprises at least two selectively isolable compartments, the system further comprising:

a pressure sensor associated with each compartment, each pressure sensor configured to sense pressure within its associated compartment and supply pressure signals representative thereof;

a temperature sensor associated with each compartment, each temperature sensor configured to sense temperature within its associated compartment and supply temperature signals representative thereof; and

wherein the processor is further configured to determine the first derivative of pressure with respect to time.

Claim 8 (original): The system of claim 7, wherein the at least two selectively isolable compartments comprises a hatch between each pairing of isolable compartments, each hatch movable between an open position, in which the compartments are in fluid communication with one another, and a closed position, in which the compartments are substantially fluidically sealed from one another, and wherein the processor is further configured to

compare the first derivatives of pressure in each compartment; and

determine whether the hatch is opened or closed position, based at least in part on the comparison.

Claim 9 (original): The system claim 8, further comprising:

memory coupled to the processor, the memory having stored therein volume data that relates predetermined volumes for each compartment and each fluidically communicable combination of compartments,

wherein the processor is further configured to determine an exact volume based at least in part on a feeding volume and the volume data and to correlate the exact volume to a particular fluidically communicable combination of compartments having the aperture.

Claim 10 (original): The system of claim 9, wherein the processor is further configured to compare a current combination of compartments having the aperture with a previously determined combination of compartments having the aperture to determine:

the addition of a compartment to the combination of compartments having the aperture and the associated hatch opening; and

the deletion of a compartment from the combination of compartments having the aperture and the associated hatch closing.

Claim 11 (original): The system of claim 8, wherein the processor is further configured to supply a hatch status signal representative of hatch position, and wherein the system further comprises a reporter coupled to receive the hatch status signal from the processor and configured to report hatch status.

Claim 12 (original): The apparatus of claim 8, wherein the processor is further configured to repeat the determination of times at which one or more predetermined pressures will be reached each time a hatch is determined to have changed state.

Claim 13 (original): The apparatus of claim 2, wherein the processor is configured with software residing in the memory.

Claim 14 (currently amended): A monitor for analyzing depressurization events resulting from an aperture in a vessel having a compartment having a predetermined volume, the monitor comprising:

a processor adapted to receive one or more pressure signals representative of sensed compartment pressure and one or more temperature signals representative of sensed compartment temperature, and configured, in response thereto, to:

determine a first derivative of pressure with respect to time and a feeding volume based at least in part on the sensed compartment pressure; and

estimate a size of a depressurization aperture based at least in part on the first derivative of pressure with respect to time, the determined feeding volume, the predetermined volume, the sensed compartment pressure, and the sensed compartment temperature.

Claim 15 (currently amended): The monitor of claim 14, wherein:

the ~~processor is further configured to determine a~~ determined feeding volume is based at least in part on the first derivative of pressure with respect to time, the predetermined volume, the sensed compartment pressure, and the sensed compartment temperature~~; and~~

~~the determination of the aperture size is further based on the determined feeding volume~~.

Claim 16 (original): The monitor of claim 14, further comprising:

a memory coupled to the processor and configured to have stored therein:
data relating to the predetermined volume; and

data that relates aperture size to feeding volume and first derivatives of pressure with respect to time,

wherein the processor is further configured to determine the aperture size based at least in part on the stored data.

Claim 17 (original): The monitor of claim 14, wherein the processor is further configured to supply information representative of the depressurization event.

Claim 18 (original): The monitor of claim 14, wherein the processor is further configured to:

determine a second derivative of pressure with respect to time in the compartment; and

determine a rate of growth of the aperture size based at least in part on the second derivative of pressure.

Claim 19 (original): The monitor of claim 14, wherein the processor is further configured to determine one or more times at which one or more predetermined pressures will be reached in the compartment.

Claim 20 (currently amended): The monitor of claim 14, wherein the compartment includes at least two selectively isolable compartments having a hatch there between, each hatch movable between an open position, in which the compartments are in fluid communication with one another, and a closed position, in which the compartments are

substantially fluidically sealed from one another, and wherein the processor is further configured to:

compare the first derivatives of pressure in each compartment; and

determine whether the hatch is in an open or a closed position, based at least in part on the comparison.

Claim 21 (original): The monitor of claim 20, further comprising:

memory coupled to the processor, the memory having stored therein volume data that relates predetermined volumes for each compartment and each fluidically communicable combination of compartments,

wherein the processor is further configured to determine an exact volume based at least in part on a feeding volume and the volume data and to correlate the exact volume to a particular fluidically communicable combination of compartments having the aperture.

Claim 22 (original): The monitor of claim 21, wherein the processor is further configured to compare a current combination of compartments having the aperture with a previously determined combination of compartments having the aperture to determine:

the addition of a compartment to the combination of compartments having the aperture and the associated hatch opening; and

the deletion of a compartment from the combination of compartments having the aperture and the associated hatch closing.

Claim 23 (original): The monitor of claim 20, wherein the processor is further configured to supply a hatch status signal representative of hatch position.

Claim 24 (original): The monitor of claim 20, wherein the processor is further configured to repeat the determination of times at which one or more predetermined pressures will be reached each time a hatch is determined to have changed state.

Claim 25 (original): The monitor of claim 16, wherein the processor is configured with software residing in the memory.

Claim 26 (currently amended): A method of analyzing depressurization events resulting from an aperture in a vessel including a compartment having a predetermined volume, the method comprising the steps of:

determining pressure, feeding volume, and temperature within the compartment;

determining a first derivative of the pressure with respect to time; ~~and~~

determining whether the compartment is depressurizing based at least in part on the determined first derivative of the pressure with respect to time; and

if it is determined that the compartment is depressurizing, determining a size of the aperture based at least in part on the determined first derivative of the pressure with respect to time, the determined feeding volume, the determined compartment pressure, the determined compartment temperature, and the predetermined volume.

Claim 27 (currently amended): The method of claim 26, ~~further comprising~~ wherein the steps of determining the feed volume is~~: determining a feeding volume~~ based at least in part on the first derivative of pressure with respect to time, the predetermined volume, the sensed compartment pressure, and the sensed compartment temperature~~; and~~

~~determining the aperture size further based on the determined feeding volume~~.

Claim 28 (original): The method of claim 27, wherein the compartment comprises at least two isolable compartments each having a predetermined volume, wherein each pair of isolable compartments has a hatch there between, each hatch having an open position, in which the pair of compartments are in fluidic communication with each other, and a closed position, in which the pair of compartments are substantially sealed from each other, the method further comprising the step of

determining an exact volume of a combination of fluidically communicating compartments having the aperture based at least in part on the feeding volume and the predetermined compartment volumes.

Claim 29 (original): The method of claim 28, further comprising the steps of:

determining a difference between a current exact volume having the aperture and a previously determined exact volume having the aperture;

determining compartments added to and deleted from the previously determined exact volume based at least in part on the predetermined compartment volumes; and

inferring changes in hatch positions based at least in part on the compartments added to and deleted from the previous exact volume.

Claim 30 (original): The method of claim 27, further comprising the steps of:

accessing data that relates aperture size to feeding volume and to first derivatives of pressure with respect to time; and

further determining the aperture size based at least in part on the accessed data.

Claim 31 (original): The method of claim 26, further comprising the step of reporting information relating to the depressurization.

Claim 32 (original): The method of claim 26, further comprising the step of determining the rate of change of the size of the aperture.

Claim 33 (original): The method of claim 32, wherein the step of determining the rate of change of the size of the aperture comprises the steps of:

determining the size of the aperture at a first time;

determining the size of the aperture at a second time, the first time and the second time defining an interval; and

differentiating the size of the aperture over the interval.

Claim 34 (original): The method of claim 32, wherein the step of determining the rate of change of the size of the aperture comprises determining a second derivative of pressure with respect to time.

Claim 35 (original): The method of claim 32, further comprising the step of predicting one or more times during the depressurization at which one or more predetermined pressures will be reached in the compartment, wherein the predictions are based at least in part on the size of the depressurization aperture, the rate of growth of the depressurization aperture, and the feeding volume.

Claim 36 (original): The method of claim 35, wherein the compartment comprises an air-pressurized, human-habitable compartment containing air-cooled equipment, the step of predicting one or more times comprises predicting a time of operational significance.

Claim 37 (original): The method of claim 36, wherein the step of predicting one or more times comprises predicting a time when non-essential personnel must be evacuated from the compartment.

Claim 38 (original): The method of claim 36, wherein the step of predicting one or more times comprises predicting a time when air-cooled equipment must be shut down in the compartment.

Claim 39 (original): The method of claim 36, wherein the step of predicting one or more times comprises predicting a time when pulmonary failure will occur for persons within the compartment.

Claim 40 (original): The method of claim 36, wherein the step of predicting one or more times comprises predicting a time when the pressure within the compartment will reach approximately 2 psi.

Claim 41 (original): The method of claim 35, wherein the step of predicting one or more times further comprises the step of reporting information regarding times.

Claim 42 (original): The method of claim 28, further comprising the step of:

determining information relating to the location of the aperture based at least in part on a comparison of the first derivatives of pressure with respect to time in each of the plurality of compartments.

Claim 43 (currently amended): A program product comprising:

(A) a depressurization analyzer executable on a computer, the analyzer including:

a depressurization detector executable on ~~a~~ the computer to detect depressurization and to determine a size of a gas depressurization aperture in a gas-pressurized compartment given temperature, pressure, and volume information relating to gas within the compartment;

a depressurization predictor executable on ~~a~~ the computer to determine a rate of growth of the aperture and to determine one or more critical times during the depressurization;

a depressurization reporter executable on ~~a~~ the computer to present information regarding the depressurization, including the one or more critical times;

and

(B) signal bearing media bearing the depressurization analyzer.

Claim 44 (original): The program product of claim 43, wherein the signal bearing media comprises recordable media.

Claim 45 (original): The program product of claim 43, wherein the signal bearing media comprises transmission media.

Claim 46 (original): The program product of claim 43, wherein the compartment comprises a plurality of isolable compartments sealable with respect to each other by hatches, the depressurization analyzer further comprising a hatch monitor executable on a computer to determine a status of at least one hatch.

Claim 47 (original): The program product of claim 46, wherein the hatch monitor is further executable on a computer to determine in which compartment of the plurality of compartments the depressurization aperture is located.

Claim 48 (original): The program product of claim 43, wherein the depressurization predictor is further executable on a computer to determine a time at which a predetermined pressure within the compartment will be reached.

Claim 49 (original): The program product of claim 43, wherein the depressurization reporter is further executable on a computer to generate display information related to a depressurization.

Claim 50 (original): The program product of claim 43, further comprising:

a depressurization simulation adapted to interact with the depressurization analyzer; and

signal bearing media bearing the depressurization simulation.

Claim 51 (new): A system for analyzing a depressurization event resulting from an aperture in a vessel having a compartment having a predetermined volume, the system comprising:

a pressure sensor configured to sense pressure within the compartment and supply pressure signals representative thereof;

a temperature sensor configured to sense temperature within the compartment and supply temperature signals representative thereof; and

a processor coupled to receive the pressure signals and the temperature signals, the processor configured, in response thereto, to:

determine a first and a second derivative of pressure with respect to time;

determine a size of the aperture based at least in part on the first derivative of pressure with respect to time, the predetermined volume, the sensed compartment pressure, and the sensed compartment temperature; and

determine a rate of growth of the determined aperture size based at least in part on the second derivative of pressure.

Claim 52 (new): A monitor for analyzing depressurization events resulting from an aperture in a vessel having a compartment having a predetermined volume, the monitor comprising:

a processor adapted to receive one or more pressure signals representative of sensed compartment pressure and one or more temperature signals representative of sensed compartment temperature, and configured, in response thereto, to:

determine a first and a second derivative of pressure with respect to time based at least in part on the sensed compartment pressure;

estimate a size of a depressurization aperture based at least in part on the first derivative of pressure with respect to time, the predetermined volume, the sensed compartment pressure, and the sensed compartment temperature; and

determine a rate of growth of the estimated depressurization aperture size based at least in part on the second derivative of pressure.

Claim 53 (new): A method of analyzing depressurization events resulting from an aperture in a vessel including a compartment having a predetermined volume, the method comprising the steps of:

determining pressure and temperature within the compartment;

determining a first derivative of the pressure with respect to time;

determining a second derivative of the pressure with respect to time;

determining whether the compartment is depressurizing based at least in part on the determined first derivative of the pressure with respect to time;

if it is determined that the compartment is depressurizing, determining a size of the aperture based at least in part on the determined first derivative of the pressure with respect to time, the determined compartment pressure, the determined compartment temperature, and the predetermined volume; and

determining a rate of change of the determined aperture size based at least in part on the second derivative of the pressure with respect to time.